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(54) BRAKING ASSEMBLY

BREMSANORDNUNG

ENSEMBLE DE FREINAGE

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Description

[0001] The present invention relates to a braking assembly, a security system associated thereto and a method of theft prevention, e.g. of wheeled carriages.

[0002] The braking assembly of the present invention may be suitably used in a variety of vehicles. However, it is especially suited for use on or in conjunction with a shopping trolley or cart.

[0003] US 5,881,846 discloses a security apparatus for a shopping cart which locks when the cart passes outside an area in which carts are to be retained. The cart lock is released manually.

[0004] European Patent No. 1 101 685 describes a vehicle braking assembly in which a braking member is activated by movement of the assembly over a magnetic material such that, when activated, the braking member moves to an operative position which serves to raise the wheel from the ground, hence preventing the vehicle from progressing beyond the magnetic material.

[0005] Other braking mechanisms are known, which operate, for example, by radio signal, infra red signal, etc. However, such braking devices generally require a motor to operate the braking mechanism. One particular disadvantage of electronic braking devices is that they require a power source, for example, a battery, to operate the receiver and/or other electronic parts. For the systems to function properly, the battery must be constantly checked or monitored and replaced or recharged.

[0006] A further disadvantage of known braking assemblies and/or anti-theft systems is that, once triggered, they must be reset.

[0007] We have now developed a braking assembly which overcomes or mitigates some of the disadvantages of the prior art.

[0008] In particular, the braking assembly of the present invention is advantageous in that, *inter alia*, a generator may be provided to power electronic components and/or to recharge a solid state battery. Furthermore, the generator may be operably linked to one or more wheels of the vehicle and thus the user of the cart or trolley will provide the motion for the generator.

[0009] The braking assembly of the present invention is advantageous in that it may be used in a manner analogous to existing assemblies, that is, to prevent a cart or trolley from being removed from, for example, a retailer's car park. However, in addition, the assembly of the invention may prevent a cart or trolley from being removed from the store, hence preventing unpaid for goods from being removed from the store.

[0010] The braking assembly of the present invention may also be used on a variety of wheels, including conventionally known trolley or cart wheels, but also including wheels used on, for example, moving walkways. By the term wheel it is intended to include one or more wheels as hereinbefore described, castors, and other rolling elements etc.

[0011] According to a first aspect of the present invention there is provided a vehicle braking assembly for a wheel comprising:

5 a braking member arranged to move relative to a main body of the wheel between an inoperative and an operative position; and trigger means adapted to activate the braking member to move to an operative position wherein the trigger means is operable by a coded message passed by a separate transmitter as electromagnetic radiation and the assembly is provided with an EMR sensor; characterised by

15 a resilient biasing member arranged to urge the braking member into the inoperative position thereby preventing the braking member from moving to an operative position and arranged to reset the braking member to an inoperative position without manual interference.

[0012] Any conventionally known brake foot may be 20 used. However, preferentially, the brake foot is the same or similar to that described in European Patent No. 1 101 685.

[0013] The wheel may optionally be provided with a circumferential brake guide, e.g. in the form of a circumferential slot or groove.

[0014] Thus a wheel assembly of the invention may comprise a wheel, supported in a fork and fixed using an axle fastening means, e.g. an axle bolt. The wheel may also be provided with a peripheral brake foot.

[0015] A variety of electromagnetic radiation (EMR) may be used to trigger and/or reset the braking assembly. Thus the EMR may comprise, radio waves, i.e. short or long wave radio waves, light waves, e.g. infra red light, visible light, UV light or any combination thereof. Preferably the light source comprises an infra red light source.

[0016] An EMR sensor may be positioned in any reasonable location on the wheel assembly, preferably the sensor is positioned in a well exposed position towards the upper part wheel assembly in its normal "in use" position.

[0017] In a preferred embodiment of the invention, the braking mechanism of the invention comprises a latch, which is operably linked to the sensor. An inner portion of the wheel comprises recessed toothed region, positioned such that, when desired, the latch may engage with one or more of the teeth. Thus, when the brake is in the inoperative position, the latch is closed and the wheel and the recessed toothed portion freely rotates. When the latch is triggered, it engages with a toothed region of the recessed portion of the wheel. The continued rotation of the wheel and the engaged latch moves the brake from an inoperative position to an operable and braking position.

[0018] Preferably the biasing member comprises a resilient blocking means which is adapted to urge the braking member into the inoperative position. Preferably, the biasing member will comprise a resilient spring, e.g. a torsion spring. The spring is preferably situated adjacent

or around the axle of the wheel assembly. In an especially preferred embodiment the wheel assembly may be provided with an axial housing for resilient spring. Thus, in use, the spring biasing means will retain the brake in the inoperable position until the trigger is activated.

[0019] It will be understood by one skilled in the art that the vehicle wheel assembly provided with a latch assembly as hereinbefore described may comprise any conventional trolley or cart wheel which requires a braking mechanism. However, preferentially, this aspect of the invention comprises a vehicle wheel assembly provided with a latch assembly wherein the vehicle wheel assembly is an assembly comprising a sensor as hereinbefore described.

[0020] Preferentially, the latch is adapted to operate in a radial direction and thus, the recess portion of the wheel is in a substantially circumferential position. Although it will be understood that the recess which co-operates with the latch may be positioned such that the latch moves axially, rather than radially. However, radial movement of the latch is preferred.

[0021] Furthermore, whilst the braking system will operate with a single toothed recess portion, the reaction time to the trigger is faster if the assembly is provided with a plurality of toothed recesses.

[0022] In the braking assembly of the invention the latch is preferably operated by a solenoid, electric motor, stepper motor, etc.

[0023] It is a particular advantage of the present invention that the braking mechanism is not required to be manually reset. Thus, after the solenoid and latch mechanism has been triggered so as to activate the braking mechanism, a second EMR source may be provided which acts as a resetting beam, e.g. triggering the solenoid, motor and/or bellows to revert to its rest position. Thus the action of the aforementioned biasing means which urges the braking mechanism into an inoperable position, acts to reset the assembly without need for manual interference.

[0024] Furthermore, in a retail environment that has, for example, an EMS tagging security system, such an EMS system may be linked to an EMR source transmitter as hereinbefore described, thus, for example sending a brake triggering message to a braking assembly device on the wheel causing the brake to activate immediately.

[0025] The solenoid or motor may, preferably be provided with a support power supply e.g. in the form of a battery and a programmable integrated chip. It is a further advantage of the present invention to provide a wheel assembly which is also adapted to act as a generator.

[0026] Preferably the power generator comprises a fixed body member and a rotatably mounted wheel member **characterised in that** one of the body member and the wheel member is provided with a stator and the other member is provided with a plurality of permanent magnets which are of alternating polarity.

[0027] In a preferred embodiment of the invention, the stationary portion of the wheel assembly e.g. the portion

housing the latch assembly, may be provided with a stator and the rotatable portion of the wheel assembly e.g. the wheel itself may be provided with one or more permanent magnets. Preferentially the wheel is provided with a plurality of permanent magnets which are of alternating polarity. Thus, in use, rotation of the wheel causes the permanent magnets to pass the stator and generate an electromagnetic field current.

[0028] It will be understood by one skilled in the art that the vehicle wheel assembly provided with a power generator as hereinbefore described may comprise any conventional trolley or cart wheel which requires a power source and/or battery recharge system. However, preferentially, this aspect of the invention comprises a vehicle wheel assembly provided with a power generator wherein in the vehicle wheel assembly is an assembly comprising a sensor as hereinbefore described.

[0029] Preferably, the stator is linked to means for recharging a battery and/or means for storing the power generated. It will be understood by one skilled in the art that this aspect of the invention may utilise a plurality of permanent magnets in the latch housing and a stator in the rotatable wheel.

[0030] Furthermore, this aspect of the invention is novel *per se* and may therefore be used in conventionally known trolley wheels, castors or other rolling elements which require a power source.

[0031] The braking assembly of the invention is advantageous in that, *inter alia*, it is capable of operating under the influence of, for example, a radio signal, infra red signal, etc. Therefore, not only can the assembly be used in, for example, preventing a wheeled vehicle being removed from a store perimeter, it may, by the correct positioning of an EMR source, be utilised as an in-store anti-theft device.

[0032] Furthermore, the assembly of the invention is advantageous in that it does not require a power source or, if the assembly is provided with a back-up power source, e.g. in the form of a battery cell, it does not require recharging or replacing. A yet further advantage of the assembly if the invention is that it comprises means for resetting the braking assembly at an appropriate moment after the braking mechanism has been triggered.

[0033] The invention will now be described by way of example only and with reference to the accompanying drawings in which Figure 1 is a side view of the wheel of the invention with braking member in first, inoperable position;

Figure 2 is a side view of the wheel with braking member in second, operable position;

Figure 3 is a front view of the wheel in the first, inoperable, position;

Figure 4 is a rear view of the wheel in the first, inoperable, position;

Figure 5 is an internal side view of one wheel of the invention;

Figure 6 is a side view of the braking member;

Figure 7 is a side view of the body of the device;

Figure 8 is an internal side view of the internal face of a second wheel;

Figure 9 is a view of the wheel through line 1 showing both rotor and stator;

Figure 10 is a sectional view of the wheel showing a standard rubber tyre or a travelator (walkway) wheel; and

Figure 11 is a view of an emitter of a twin beam showing the general effect on the wheel.

[0034] In the illustrated embodiment there is provided a castor 1 having connection means to the vehicle through forks and a bolt arrangement that allows rotation between the wheel and the vehicle. From the side view in drawing 1 there is also seen a wheel 3 which rotates about the axle 4 and brake member 5 which is shown here in its first or non braking position and in Fig 2 in its second or braking position. In Fig 3 viewing the device from the front there is provided two wheels 3a and 3b within the castor and a body 6 that will remain fixed in relation to the castor. In such cases where there is a fixed central body it is possible to have the fixing means to the vehicle from the fixed body but for strength reasons this is unlikely to be the preferred option. The fixed body allows for the inclusion of the electronic components of the device including the light receiver 7 if the device is operated by infrared means.

[0035] There is also provided in the body a slot 8 that allows for the rotation of the brake member from its first to its second position. A view of the back, trailing aspect, of the castor is shown on Fig 4.

[0036] When the device is triggered there is engagement between the braking member 5 and wheel 3a. There is in wheel 3a provided a toothed connection means 9 which in the preferred embodiment is in a recess show in Fig 5 and 10. As the wheel will be rotating as part of normal use when the latch 10 is operated around pivot point 11 as shown in Fig 6 there will be a connection between tooth and latch which will drive the brake member to rotate from its first to its second and triggered position. The braking member also includes the brake foot 12 which comes between the wheel and the ground in the braking position. There is provided within the body the slot 8 but this is limited in length to stop the brake member from rotating through too great an angle and become ineffective. There is shown on the braking member a contact point that will come against the end of the slot to prevent further rotation. There is also provided in

the braking member a cut away section 14 which will allow for the provision of a solenoid or motor 15.

[0037] In Fig 7 there is shown a body of the castor 6 with light collector 7 and solenoid or motor 15. There is provided within a body a sealed chamber 16 which will also contain a programmable integrated chip 17 and a rechargeable support battery 18. The solenoid could then operate from within this sealed area and its required movement can be transmitted through flexible bellows 19. When triggered the solenoid or motor 15 will extend and rotate the latch around pivot point 11 to engage one of the teeth 9 within the wheel 3a.

[0038] When the braking system is no longer required the solenoid or motor 15 will return from its extended position and thereby allow the latch to drop out of engagement. In order to return the braking member to its first position there is provided a spring 20 which will be overcome while the user is pushing the trolley against the tooth connection but when there is no pushing it will bring the braking member back to its first position. There is also provided a stop section 21 in slot 8.

[0039] If the wheel is used in conjunction with a moving walkway there will be provided on the base of the body a pad 22 which will grip the grid of the moving walkway in the usual way.

[0040] Figure 8 shows wheel 3b which has set into it a number of magnets 23 they will be arranged with a north pole and a south pole facing inward alternately to provide a rotor as part of the generator. The stator 25, as shown in Figure 9 being a view through line 1 with the inclusion of the stator is coil arrangement 24 of known type. As a small wheel such as a 125mm castor rotates often while being pushed at a reasonable walking pace it is expected that a generator of this type will provide ample power for the device's requirements. Advantageously a generator constructed in this way could have a membrane between the rotor and the stator that will prevent the ingress of dirt from damaging the workings of the stator. Figure 10 shows the recess within wheel 3a and two kinds of tyre one conventional rubber or polyurethane 10a and the other suitable for the walkway application 10b.

[0041] Figure 11 shows a likely use of the invention at the perimeter of the store car park where twin and parallel beams are emitted from a single or dual container. The programmable chip in the device will respond to different coded messages contained within the beams. In the illustration beam 26 will be recognised as a reset instruction and beam 27 as a trigger message. Therefore, and assuming that the vehicle is in an area permitted by the owner, when the vehicle is being pushed out through the beams it will receive a reset message which will be ignored and then the trigger message. In response to the trigger message the solenoid or motor 15 will operate outward to rotate the latch 10 and generally engage the brake member 5 with the wheel 3a. The solenoid or motor may only operate for a given period but then operate again if the vehicle is not pushed through the reset beam.

When the device is pushed or dragged through the reset beam then the motor will operate and the return means 20 will bring the brake member to its inoperable position. A similar operation could be achieved by the use of two radio transmitters where one signal is generally set beyond the first.

[0042] Advantageously, the same system of triggering the device can be used in the store where the device receives a message from a transmitter as it enters an area, for example a supermarket sales floor. The device will receive a number of other messages from additional emitters within the area to which it may respond by braking. The general purpose of this would be to permit a trolley to leave the store only if it had passed through a paying point, for example a check out desk. Various timer lockouts can be programmed in to the chip to allow, for example, a trolley to leave within sixty seconds as experience has shown that people walk in and out of stores without shopping. In this way the present invention can both prevent trolleys from being removed from the site but also prevent goods from being removed by trolley if they have not passed through the payment area.

Claims

1. A vehicle braking assembly for a wheel (1) comprising:

a braking member (12) arranged to move relative to a main body of the wheel (1) between an inoperative and an operative position; and trigger means adapted to activate the braking member (12) to move to an operative position wherein the trigger means is operable by a coded message passed by a separate transmitter as electromagnetic radiation and the assembly is provided with an EMR sensor; **characterised by**
a resilient biasing member (20) arranged to urge the braking member (12) into the inoperative position thereby preventing the braking member (12) from moving to an operative position and arranged to reset the braking member (12) to an inoperative position without manual interference.

2. A vehicle braking assembly according to Claim 1 wherein said braking member comprises a brake foot arranged to locate between the wheel and a ground surface in the operative position.
3. A vehicle braking assembly according to Claim 1 wherein the wheel is provided with a circumferential brake guide.
4. A vehicle braking assembly according to Claim 3 wherein the circumferential brake guide (6) is in the

form of a slot (8) or groove.

5. A vehicle braking assembly according to Claim 3 wherein the brake guide is provided on only a portion of the circumference of the wheel.
6. A vehicle braking assembly according to Claim 3 wherein the circumferential brake guide is formed by the mating of a pair of facing wheel members.
7. A vehicle braking assembly according to Claim 6 wherein each of the wheel members comprises a wheel and a wheel body, the diameter of the wheel body being less than the diameter of the wheel.
8. A vehicle braking assembly according to Claim 7 wherein the braking assembly is provided on a wheel assembly which comprises a wheel supported in a fork and fixed using an axle fastening means.
9. A vehicle braking assembly according to Claim 1 wherein the wheel is provided with a peripheral brake foot.
10. A vehicle braking assembly according to Claim 1 wherein an EMR sensor is positioned in a well exposed position towards the upper part of the wheel assembly in its normal "in use" position.
11. A vehicle braking assembly according to Claim 1 wherein the trigger means includes a latch (10) which is operably linked to the sensor.
12. A vehicle braking assembly according to Claim 1 wherein the electromagnetic radiation (EMR) is used to trigger and/or reset the braking assembly.
13. A vehicle braking assembly according to Claim 1 wherein the EMR is selected from radio waves and/or light waves, and/or infra red light, and/or visible light, and/or UV light or any combination thereof.
14. A vehicle braking assembly according to Claim 13 wherein the EMR is infra red light.
15. A vehicle braking assembly according to any one of Claims I to 14 wherein the trigger means comprises a latch (10) which is adapted to engage with a toothed portion of the body of the wheel.
16. A vehicle braking assembly according to Claim 15 wherein an inner portion of the wheel comprises a recessed toothed region, positioned such that when the trigger is activated the latch engages with a tooth.
17. A vehicle braking assembly according to Claim 16 wherein when the brake is in the inoperative position, the latch is closed and the wheel and the recessed

- toothed portion of the wheel freely rotate and when the trigger is activated the latch engages with a toothed region of the recessed portion of the wheel which acts to move the brake from an inoperable position to an operable position.
18. A vehicle braking assembly device according to Claim 17 wherein the latch is adapted to operate in a radial direction and the toothed portion of the wheel comprises a substantially circumferential recess.
19. A vehicle braking assembly according to Claim 15 **characterised in that** the wheel is provided with a plurality of recessed teeth.
20. A vehicle braking assembly according to Claim 1 wherein the biasing member comprises a resilient spring.
21. A vehicle braking assembly according to Claim 20 wherein the spring is situated adjacent or around the axle of the wheel assembly.
22. A vehicle braking assembly according to Claim 21 wherein the wheel assembly may be provided with an axial housing for resilient spring.
23. A vehicle braking assembly according to any preceding claim wherein the braking mechanism is adapted to be automatically reset.
24. A vehicle braking assembly according to Claim 23 wherein a second EMR source is provided which provides a resetting beam.
25. A vehicle braking assembly according to Claim 24 wherein the second EMR source triggers a solenoid, motor and/or bellows to revert to a rest position.
26. A vehicle braking assembly according to Claim 1 wherein the transmitter comprises a first EMR source operably linked to an EMS tagging security system.
27. A vehicle braking assembly according to Claim 15 wherein the latch is preferably operated by a solenoid or motor.
28. A vehicle braking assembly according to Claim 27 wherein the solenoid or motor is operably linked to a bellows.
29. A vehicle braking assembly according to Claim 27 wherein the solenoid is provided with a support power supply.
30. A vehicle braking assembly according to Claim 29 wherein the support power supply is in the form of a solid state battery.
31. A vehicle braking assembly according to Claim 27 wherein the solenoid is operably linked to a programmable integrated chip.
- 5 32. A vehicle braking assembly according to Claim 1 wherein the wheel assembly is adapted to act as a generator.
- 10 33. A vehicle braking assembly according to Claim 29 wherein a generator is provided adapted to recharge the support power supply.
- 15 34. A vehicle wheel assembly according to any preceding claim adapted to act as a power generator, comprising; a fixed body member and a rotatably mounted wheel member; wherein one of the body member and the wheel member is provided with a stator (25) and a remaining member is provided with a plurality of permanent magnets (23) which are of alternating polarity.
- 20 35. A vehicle wheel assembly according to Claim 34 wherein one of a wheel member and a wheel body member is provided with a stator and a remaining member is provided with a plurality of permanent magnets which are of alternating polarity.
- 25 36. A vehicle wheel assembly according to Claim 34 or 35 wherein the body member is provided with a stator and the wheel member is provided with a plurality of permanent magnets.
- 30
- 35 **Patentansprüche**
1. Fahrzeug-Bremsbaugruppe für ein Rad (1), die Folgendes umfasst
ein Bremselement (12), das dafür angeordnet ist, sich im Verhältnis zu einem Hauptkörper des Rades (1) zwischen einer Ruhe- und einer Betriebsstellung zu bewegen, und
Auslösemittel, die dafür eingerichtet sind, das Bremselement (12) zu betätigen, damit es sich zu einer Betriebsstellung bewegt, wobei die Auslösemittel durch eine codierte Nachricht betätigt werden können, die durch einen gesonderten Sender als elektromagnetische Strahlung übermittelt wird, und die Baugruppe mit einem EMR-Sensor versehen ist, **gekennzeichnet durch**
ein elastisches Vorspannlement (20), das dafür angeordnet ist, das Bremselement (12) in die Ruhestellung zu drängen, wodurch verhindert wird, dass sich das Bremselement (12) zu einer Betriebsstellung bewegt, und dafür angeordnet ist, das Bremselement (12) ohne einen manuellen Eingriff zu einer Ruhestellung zurückzusetzen.

2. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei das Bremselement einen Bremsschuh umfasst, der dafür angeordnet ist, sich in der Betriebsstellung zwischen dem Rad und einer Bodenfläche zu befinden.
3. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei das Rad mit einer umlaufenden Bremsenführung versehen ist.
4. Fahrzeug-Bremsbaugruppe nach Anspruch 3, wobei die umlaufende Bremsenführung (6) die Form eines Schlitzes (8) oder einer Rille hat.
5. Fahrzeug-Bremsbaugruppe nach Anspruch 3, wobei die Bremsenführung an nur einem Abschnitt des Umfangs des Rades bereitgestellt wird.
- 10 6. Fahrzeug-Bremsbaugruppe nach Anspruch 3, wobei die umlaufende Bremsenführung durch das Zusammenpassen eines Paares von einander gegenüberstehenden Radelementen gebildet wird.
- 15 7. Fahrzeug-Bremsbaugruppe nach Anspruch 6, wobei jedes der Radelemente ein Rad und einen Radkörper umfasst, wobei der Durchmesser des Radkörpers geringer ist als der Durchmesser des Rades.
- 20 8. Fahrzeug-Bremsbaugruppe nach Anspruch 7, wobei die Bremsbaugruppe an einer Radbaugruppe bereitgestellt wird, die ein in einer Gabel getragenes und unter Verwendung eines Achsbefestigungsmittels befestigtes Rad umfasst.
- 25 9. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei das Rad mit einem Umfangsbremsschuh versehen ist.
- 30 10. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei ein EMR-Sensor in seiner normalen "In-Gebrauch"-Stellung in einer gut freigelegten Stellung zum oberen Teil der Radbaugruppe hin angeordnet ist.
- 35 11. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei das Auslösemittel eine Klinke (10) einschließt, die wirksam mit dem Sensor verbunden ist.
- 40 12. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei die elektromagnetische Strahlung (EMR) dafür verwendet wird, die Bremsbaugruppe auszulösen und/oder zurückzusetzen.
- 45 13. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei die EMR ausgewählt ist aus Funkwellen und/oder Lichtwellen und/oder Infrarotlicht und/oder sichtbarem Licht und/oder UV-Licht oder einer beliebigen Kombination derselben.
- 50 14. Fahrzeug-Bremsbaugruppe nach Anspruch 13, wobei die EMR Infrarotlicht ist.
- 5 15. Fahrzeug-Bremsbaugruppe nach einem der Ansprüche 1 bis 14, wobei das Auslösemittel eine Klinke (10) umfasst, die dafür eingerichtet ist, mit einem gezahnten Abschnitt des Körpers des Rades ineinanderzugreifen.
16. Fahrzeug-Bremsbaugruppe nach Anspruch 15, wobei ein innerer Abschnitt des Rades einen ausgesparten gezahnten Abschnitt umfasst, der derart angeordnet ist, dass die Klinke mit einem Zahn ineinandergreift, wenn der Auslöser betätigt wird.
17. Fahrzeug-Bremsbaugruppe nach Anspruch 16, wobei, wenn sich die Bremse in der Ruhestellung befindet, die Klinke geschlossen ist und sich das Rad und der ausgesparte gezahnte Abschnitt des Rades frei drehen, und wenn der Auslöser betätigt wird, die Klinke mit einem gezahnten Bereich des ausgesparten Abschnitts des Rades ineinandergreift, was veranlasst, dass die Bremse von einer Ruhestellung zu einer Betriebsstellung bewegt wird.
18. Fahrzeug-Bremsbaugruppe nach Anspruch 17, wobei die Klinke dafür eingerichtet ist, in einer radialen Richtung zu arbeiten, und der gezahnte Abschnitt des Rades eine im Wesentlichen umlaufende Ausparung umfasst.
19. Fahrzeug-Bremsbaugruppe nach Anspruch 15, **durch gekennzeichnet, dass** das Rad mit mehreren ausgesparten Zähnen versehen ist.
20. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei das Vorspannelement eine elastische Feder umfasst.
21. Fahrzeug-Bremsbaugruppe nach Anspruch 20, wobei die Feder angrenzend an oder um die Achse der Radbaugruppe angeordnet ist.
22. Fahrzeug-Bremsbaugruppe nach Anspruch 21, wobei die Radbaugruppe mit einem axialen Gehäuse für die elastische Feder versehen sein kann.
23. Fahrzeug-Bremsbaugruppe nach einem der vorhergehenden Ansprüche, wobei der Bremsmechanismus dafür eingerichtet ist, selbsttätig zurückgesetzt zu werden.
24. Fahrzeug-Bremsbaugruppe nach Anspruch 23, wobei eine zweite EMR-Quelle bereitgestellt wird, die einen zurücksetzenden Strahl bereitstellt.
25. Fahrzeug-Bremsbaugruppe nach Anspruch 24, wobei die zweite EMR-Quelle eine Zylinderspule, einen

- Motor und/oder einen Balgen auslöst, um zu einer Ruhestellung zurückzukehren.
26. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei der Sender eine erste EMR-Quelle umfasst, die wirksam mit einem EMS-Kennzeichnungssicherheitssystem verknüpft ist. 5
27. Fahrzeug-Bremsbaugruppe nach Anspruch 15, wobei die Klinke vorzugsweise durch eine Zylinderspule oder einen Motor betrieben wird. 10
28. Fahrzeug-Bremsbaugruppe nach Anspruch 27, wobei die Zylinderspule oder der Motor wirksam mit einem Balgen verknüpft ist. 15
29. Fahrzeug-Bremsbaugruppe nach Anspruch 27, wobei die Zylinderspule mit einer Unterstützungsenergiequelle versehen ist. 20
30. Fahrzeug-Bremsbaugruppe nach Anspruch 29, wobei die Unterstützungsenergiequelle die Form einer Festkörperbatterie hat. 25
31. Fahrzeug-Bremsbaugruppe nach Anspruch 27, wobei die Zylinderspule wirksam mit einem programmierbaren integrierten Chip verknüpft ist. 30
32. Fahrzeug-Bremsbaugruppe nach Anspruch 1, wobei die Radbaugruppe dafür eingerichtet ist, als ein Generator zu wirken. 35
33. Fahrzeug-Bremsbaugruppe nach Anspruch 29, wobei ein Generator bereitgestellt wird, der dafür eingerichtet ist, die Unterstützungsenergiequelle wieder aufzuladen.
34. Fahrzeug-Bremsbaugruppe nach einem der vorhergehenden Ansprüche, die dafür eingerichtet ist, als ein Energieerzeuger zu wirken, wobei sie Folgendes umfasst:
- ein unbewegliches Körperelement und ein drehbar angebrachtes Radelement, wobei eine der Komponenten Körperelement und Radelement mit einem Ständer (25) versehen ist und ein verbleibendes Element mit mehreren Dauermagneten (23), die eine abwechselnde Polarität haben, versehen ist.
35. Fahrzeug-Bremsbaugruppe nach Anspruch 34, wobei eine der Komponenten Radelement und Radkörperelement mit einem Ständer versehen ist und ein verbleibendes Element mit mehreren Dauermagneten, die eine abwechselnde Polarität haben, versehen ist. 45
36. Fahrzeug-Bremsbaugruppe nach Anspruch 34 oder 50
- 35, wobei das Körperelement mit einem Ständer versehen ist und das Radelement mit mehreren Dauermagneten versehen ist.
- ### Revendications
1. Ensemble de freinage de véhicule pour une roue (1) comprenant :
- un élément de freinage (12) agencé de manière à se déplacer par rapport à un corps principal de la roue (1) entre une position non fonctionnelle et une position fonctionnelle ; et des moyens de déclenchement pour activer l'élément de freinage (12) pour se déplacer vers une position fonctionnelle où les moyens de déclenchement sont actionnables par un message codé envoyé par un émetteur séparé sous forme de rayonnement électromagnétique et l'ensemble est muni d'un capteur de rayonnement électromagnétique; **caractérisé par** un élément de poussée (20) agencé pour pousser l'élément de freinage (12) dans la position non fonctionnelle empêchant ainsi l'élément de freinage (12) de se déplacer vers une position fonctionnelle et agencé pour replacer l'élément de freinage (12) dans une position non fonctionnelle sans intervention manuelle.
2. Ensemble de freinage de véhicule selon la revendication 1, où ledit élément de freinage comprend un frein à pied agencé pour être situé entre la roue et une surface du sol dans la position fonctionnelle.
 3. Ensemble de freinage de véhicule selon la revendication 1, où la roue est munie d'un guide de frein circonférentiel.
 4. Ensemble de freinage de véhicule selon la revendication 3, où le guide de frein circonférentiel (6) est sous la forme d'une fente (8) ou d'une rainure.
 5. Ensemble de freinage de véhicule selon la revendication 3, où le guide de frein est prévu uniquement sur une partie de la circonference de la roue.
 6. Ensemble de freinage de véhicule selon la revendication 3, où le guide de frein circonférentiel est formé par l'appariement d'une paire d'éléments de roue opposés.
 7. Ensemble de freinage de véhicule selon la revendication 6, où chacun des éléments de roue comprend une roue et un corps de roue, le diamètre du corps de roue étant inférieur au diamètre de la roue.
 8. Ensemble de freinage de véhicule selon la revendi-

cation 7, où l'ensemble de freinage est prévu sur un ensemble de roue qui comprend une roue supportée dans une fourche et fixée en utilisant un moyen de fixation sur un essieu.

9. Ensemble de freinage de véhicule selon la revendication 1, où la roue est munie d'un frein à pied périphérique.
10. Ensemble de freinage de véhicule selon la revendication 1, où un capteur de rayonnement électromagnétique est positionné dans une position bien exposée vers la partie supérieure de l'ensemble de roue dans sa position normale "d'utilisation".
11. Ensemble de freinage de véhicule selon la revendication 1, où les moyens de déclenchement comprennent un loquet (10) qui est relié de manière fonctionnelle au capteur.
12. Ensemble de freinage de véhicule selon la revendication 1, où le rayonnement électromagnétique (EMR) est utilisé pour désarmer et/ou réarmer l'ensemble de freinage.
13. Ensemble de freinage de véhicule selon la revendication 1, où le rayonnement électromagnétique est choisi parmi les ondes radio, et/ou les ondes lumineuses, et/ou la lumière infrarouge, et/ou la lumière visible, et/ou la lumière UV ou une combinaison quelconque de ces dernières.
14. Ensemble de freinage de véhicule selon la revendication 13, où le rayonnement électromagnétique est la lumière infrarouge.
15. Ensemble de freinage de véhicule selon l'une quelconque des revendications 1 à 14, où les moyens de déclenchement comprennent un loquet (10) qui est adapté pour mettre en prise une partie dentée du corps de la roue.
16. Ensemble de freinage de véhicule selon la revendication 15, où une partie intérieure de la roue comprend une région dentée encastrée, positionnée de sorte que quand le déclencheur est activé le loquet entre en prise avec une dent.
17. Ensemble de freinage de véhicule selon la revendication 16, où quand le frein est dans la position non fonctionnelle, le loquet est fermé et la roue et la partie dentée encastrée de la roue tournent librement et quand le déclencheur est activé le loquet est en prise avec une région dentée de la partie encastrée de la roue qui agit pour déplacer le frein d'une position non fonctionnelle à une position fonctionnelle.
18. Ensemble de freinage de véhicule selon la revendi-

cation 17, où le loquet est adapté pour fonctionner dans une direction radiale et la partie dentée de la roue comprend un encastrement sensiblement circonférentiel.

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19. Ensemble de freinage de véhicule selon la revendication 15, **caractérisé en ce que** la roue est munie d'une pluralité de dents encastrées.
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20. Ensemble de freinage de véhicule selon la revendication 1, où l'élément de poussée comprend un ressort élastique.
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21. Ensemble de freinage de véhicule selon la revendication 20, où le ressort est situé de manière adjacente ou autour de l'essieu de l'ensemble de roue.
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22. Ensemble de freinage de véhicule selon la revendication 21, où l'ensemble de roue peut être muni d'un logement axial pour le ressort élastique.
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23. Ensemble de freinage de véhicule selon l'une quelconque des revendications précédentes, où le mécanisme de freinage est adapté pour être réarmé automatiquement.
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24. Ensemble de freinage de véhicule selon la revendication 23, où une deuxième source de rayonnement électromagnétique est prévue qui fournit un faisceau de réarmement.
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25. Ensemble de freinage de véhicule selon la revendication 24, où la deuxième source de rayonnement électromagnétique déclenche un solénoïde, un moteur et/ou un soufflet pour revenir à une position de repos.
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26. Ensemble de freinage de véhicule selon la revendication 1, où l'émetteur comprend une première source de rayonnement électromagnétique reliée de manière fonctionnelle à un système marquage de sécurité de système de gestion du moteur.
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27. Ensemble de freinage de véhicule selon la revendication 15, où le loquet est actionné de préférence par un solénoïde ou un moteur.
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28. Ensemble de freinage de véhicule selon la revendication 27, où le solénoïde ou le moteur est relié de manière fonctionnelle à un soufflet.
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29. Ensemble de freinage de véhicule selon la revendication 27, où le solénoïde est muni d'une alimentation en énergie de support.
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30. Ensemble de freinage de véhicule selon la revendication 29, où l'alimentation en énergie de support est sous la forme d'une batterie à électrolyte solide.

31. Ensemble de freinage de véhicule selon la revendication 27, où le solénoïde est relié de manière fonctionnelle à une puce intégrée programmable.
32. Ensemble de freinage de véhicule selon la revendication 1, où l'ensemble de roue est adapté pour agir en tant qu'un générateur. 5
33. Ensemble de freinage de véhicule selon la revendication 29, où un générateur est prévu de manière adaptée à recharger l'alimentation en énergie de support. 10
34. Ensemble de roue de véhicule selon l'une quelconque des revendications précédentes adapté pour agir en tant qu'un générateur d'énergie, comprenant : 15
- un élément de corps fixe et un élément de roue monté rotatif ; où l'un parmi l'élément de corps et l'élément de roue est muni d'un stator (25) et un élément restant est muni d'une pluralité d'aimants permanents (23) qui sont de polarité alternée. 20
35. Ensemble de roue de véhicule selon la revendication 34, où l'un parmi un élément de roue et un élément de corps de roue est muni d'un stator et un élément restant est muni d'une pluralité d'aimants permanents qui sont de polarité alternée. 30
36. Ensemble de roue de véhicule selon la revendication 34 ou 35, où l'élément de corps est muni d'un stator et l'élément de roue est muni d'une pluralité d'aimants permanents. 35

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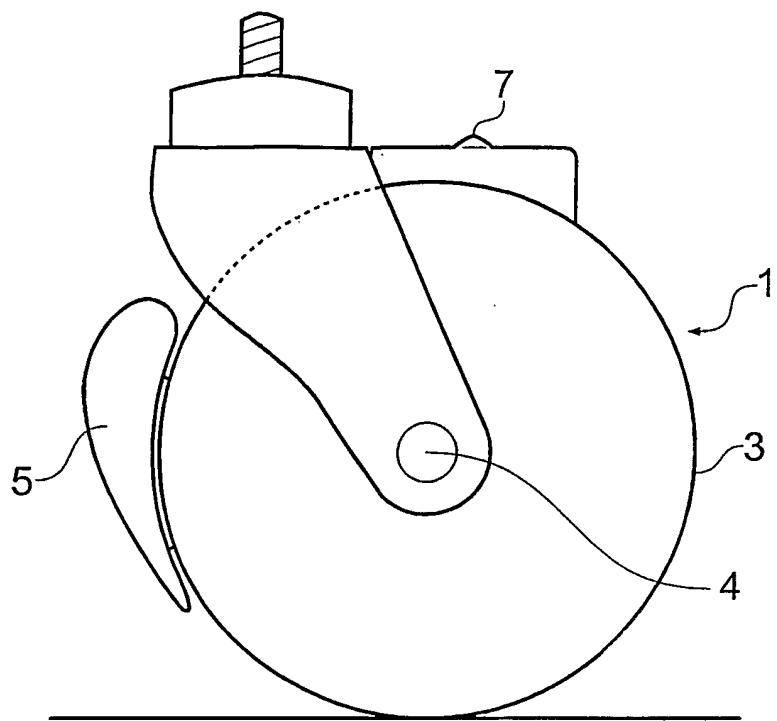


Fig. 1

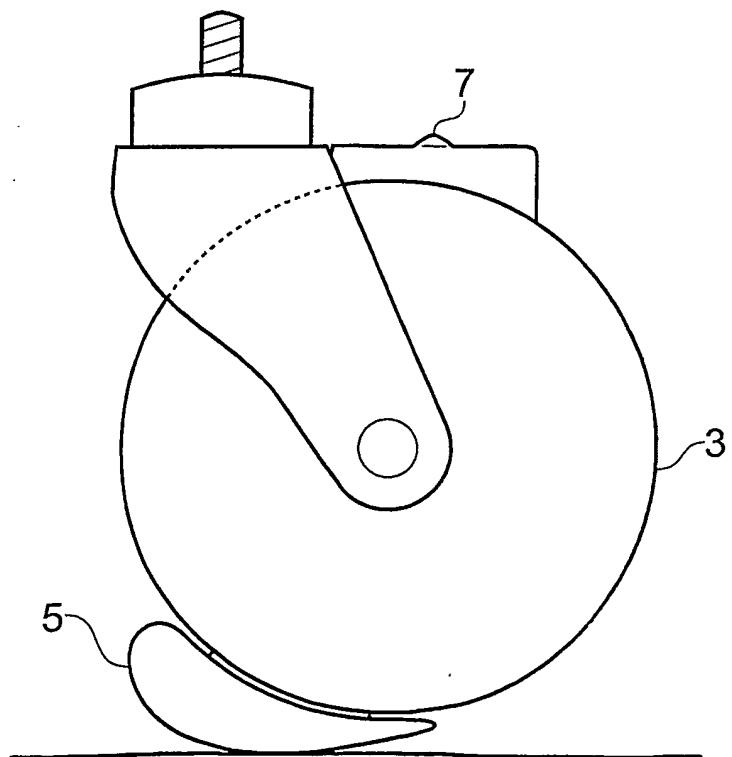


Fig. 2

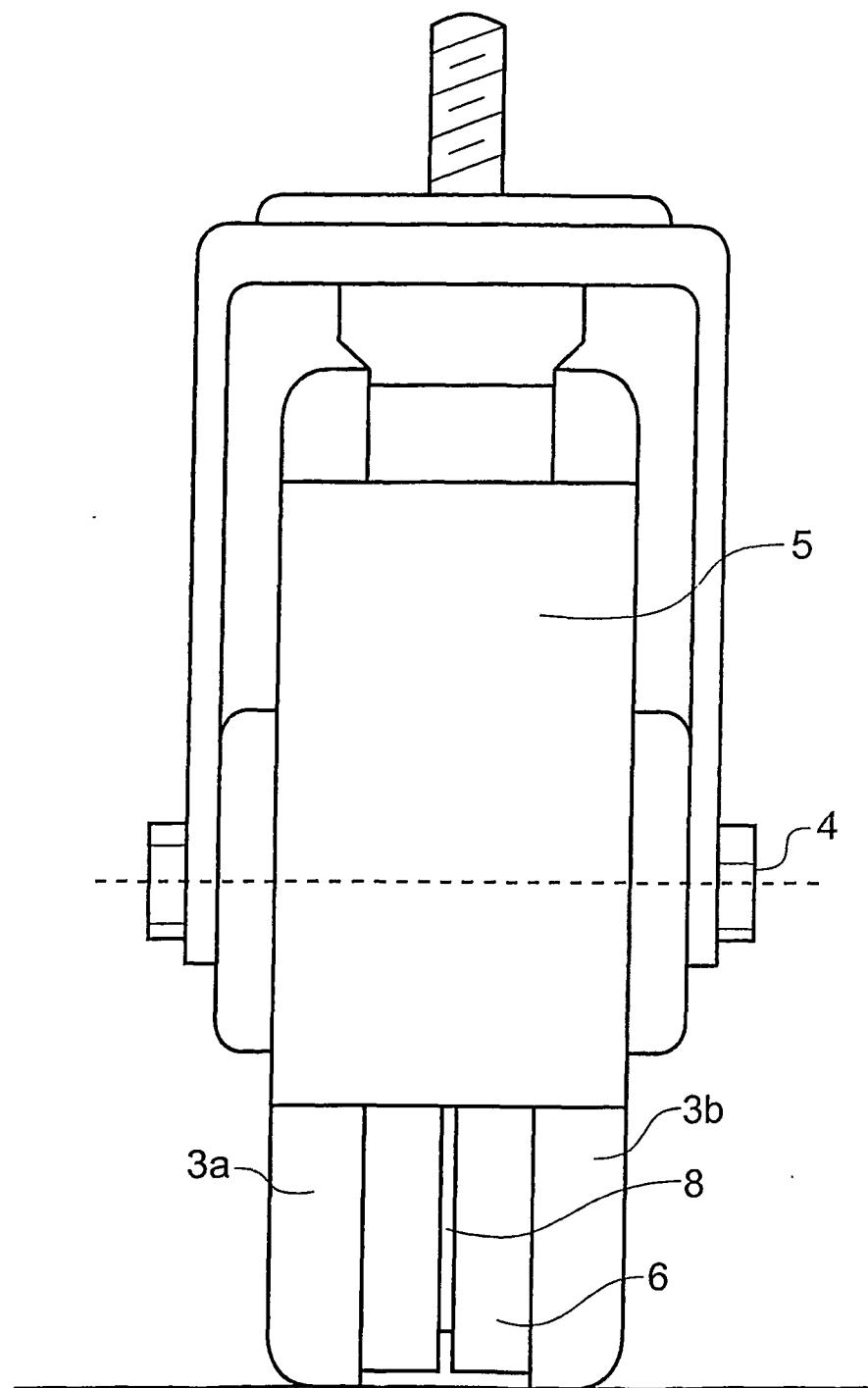


Fig. 3

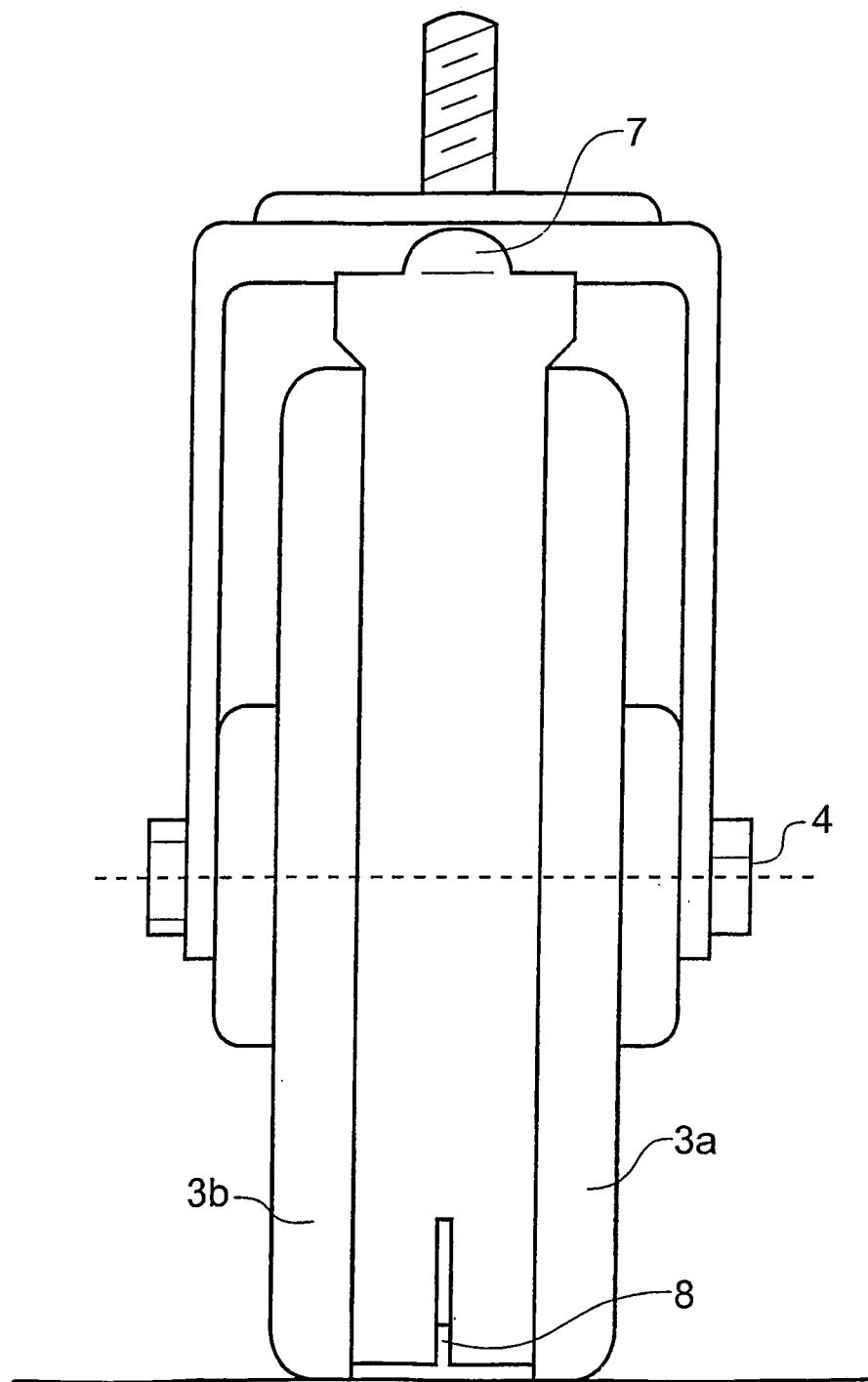


Fig. 4

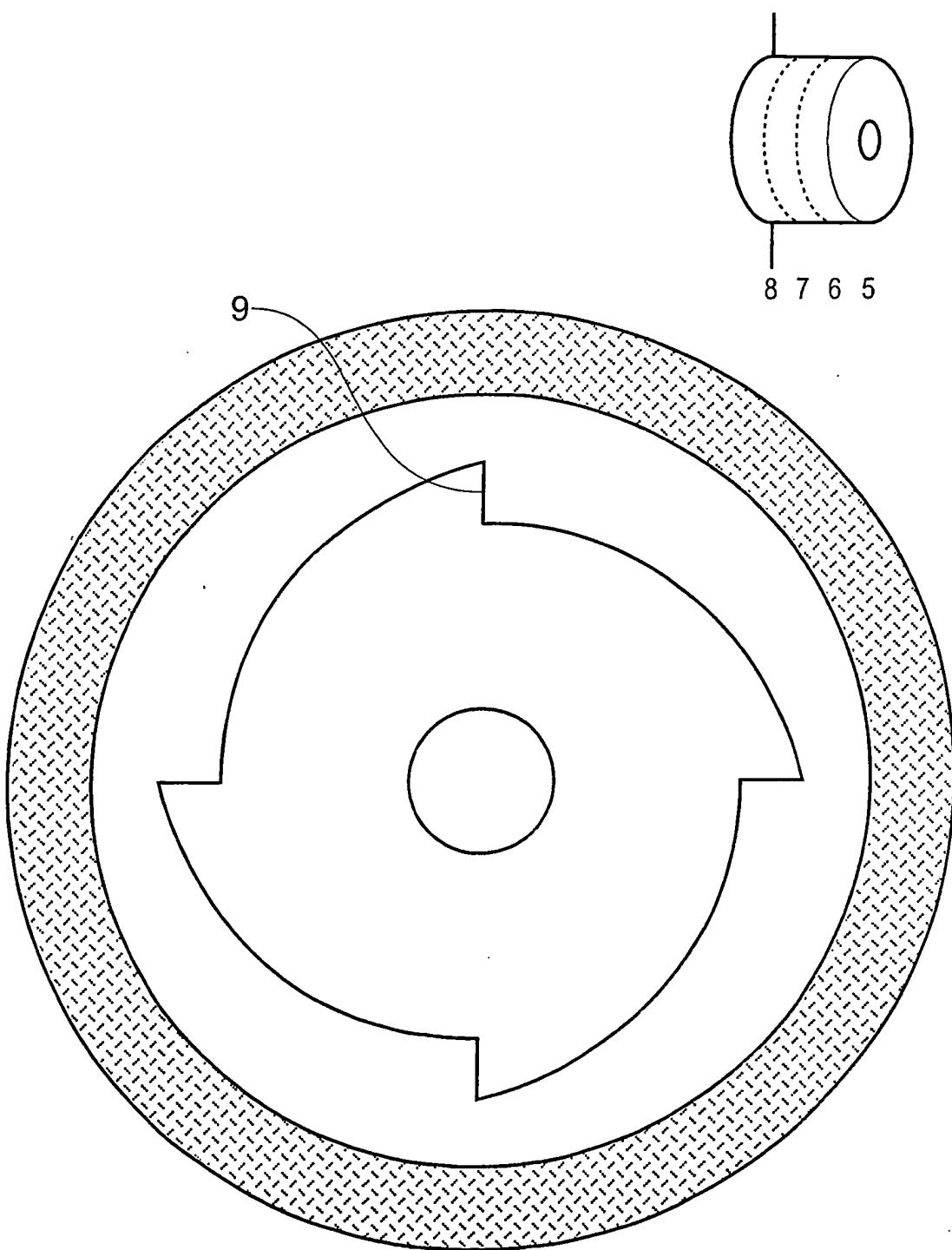


Fig. 5

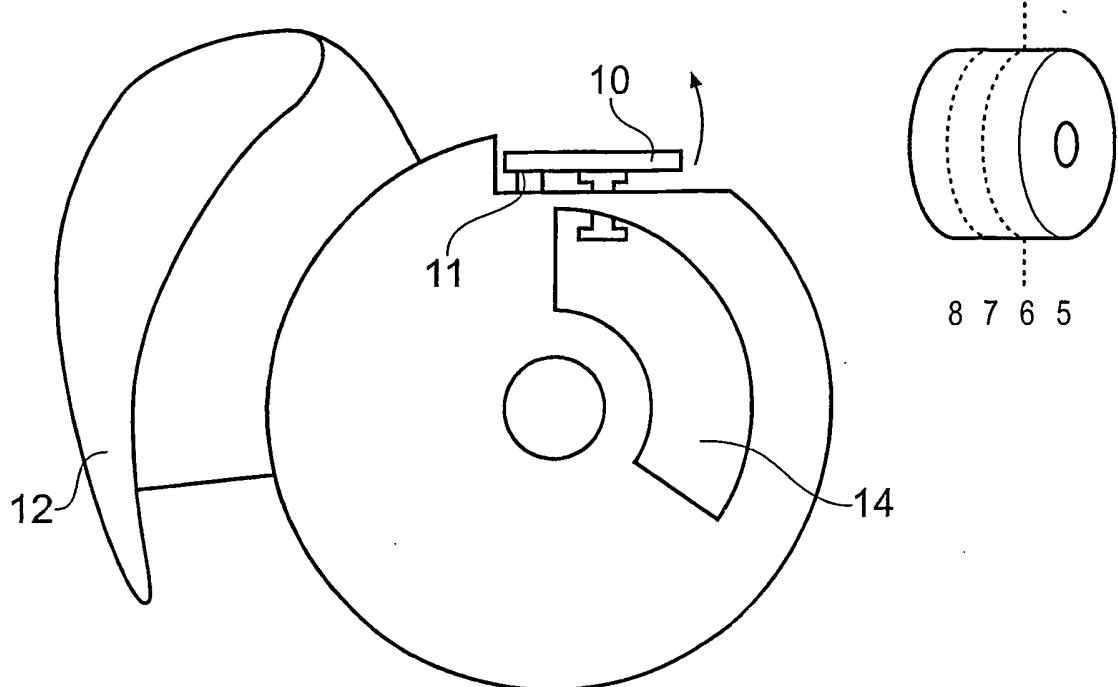


Fig. 6

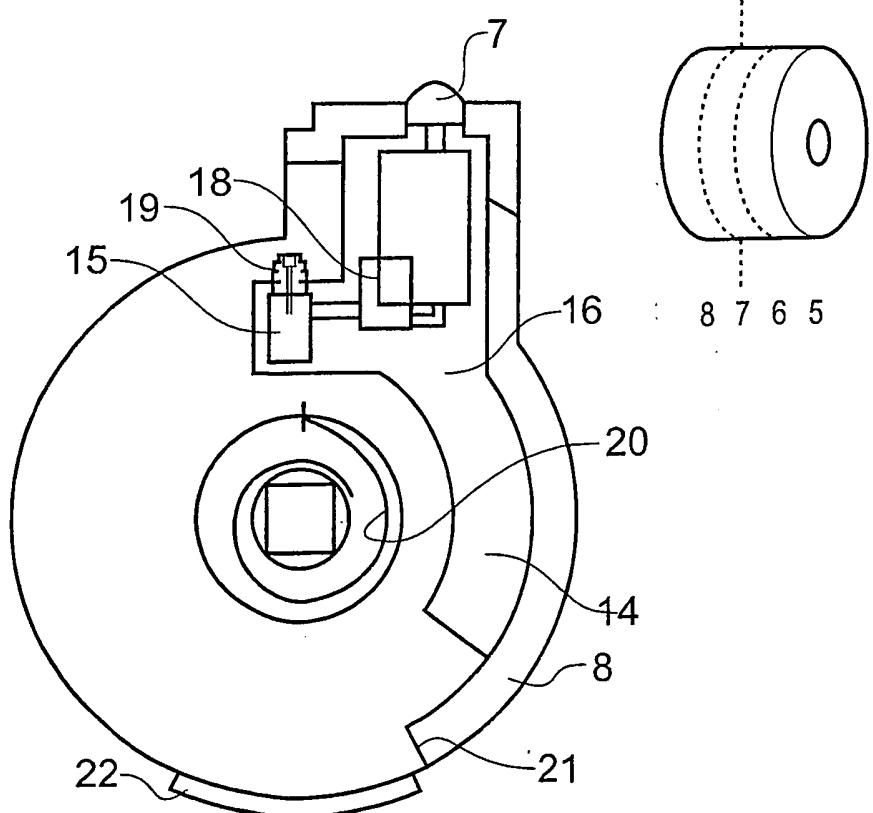
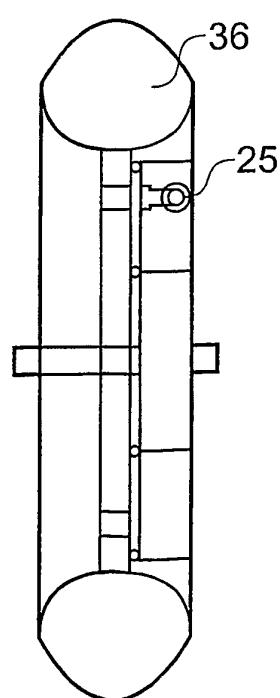
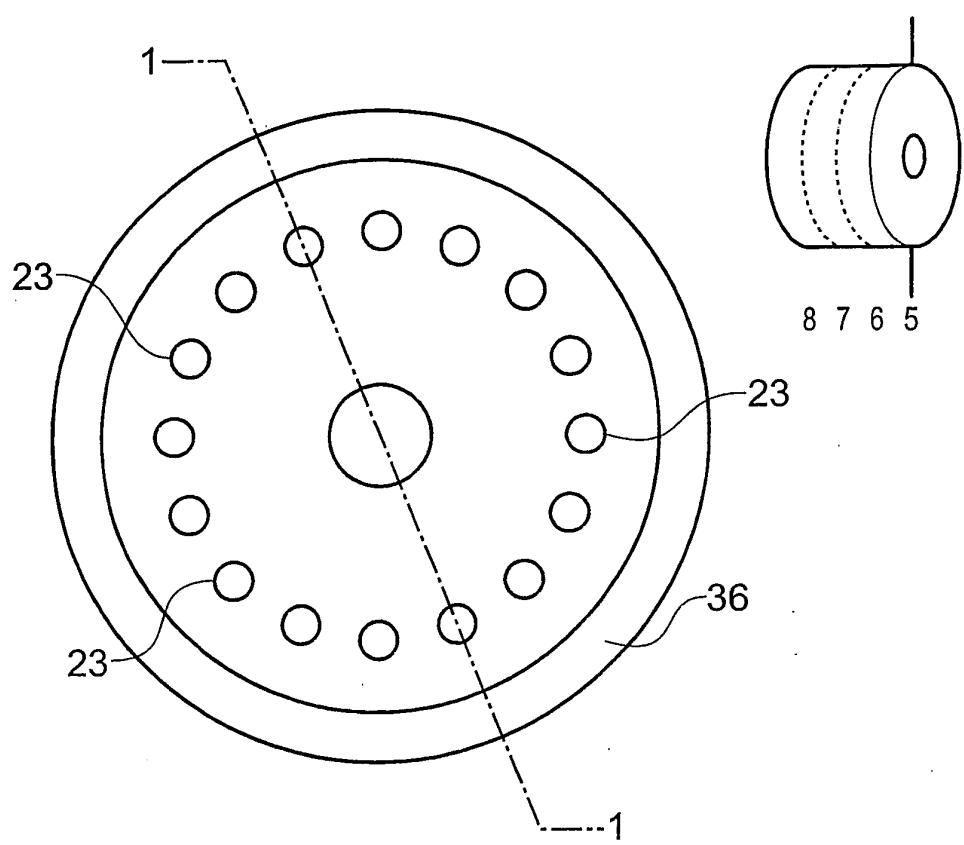


Fig. 7



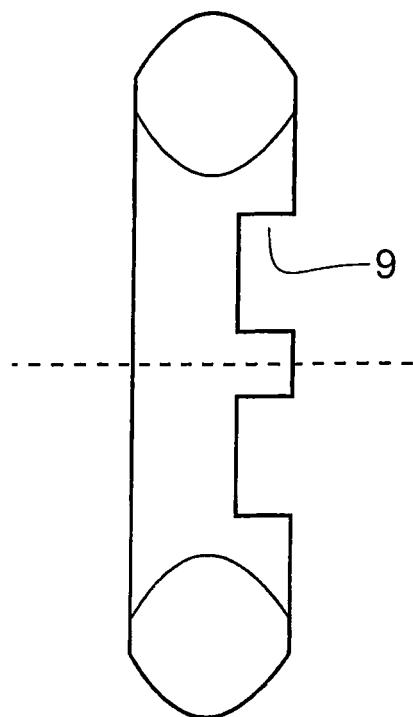


Fig. 10a

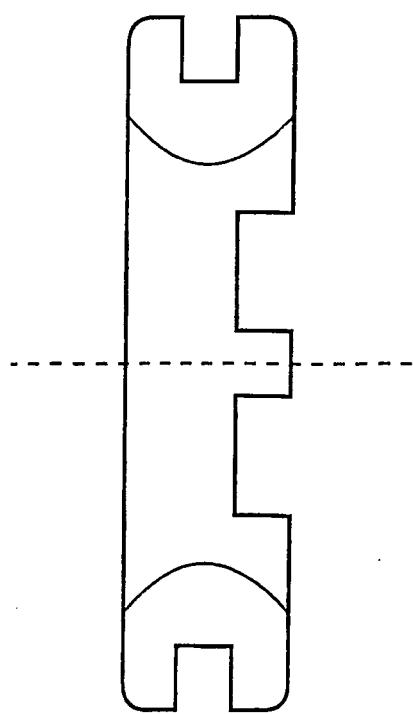


Fig. 10b

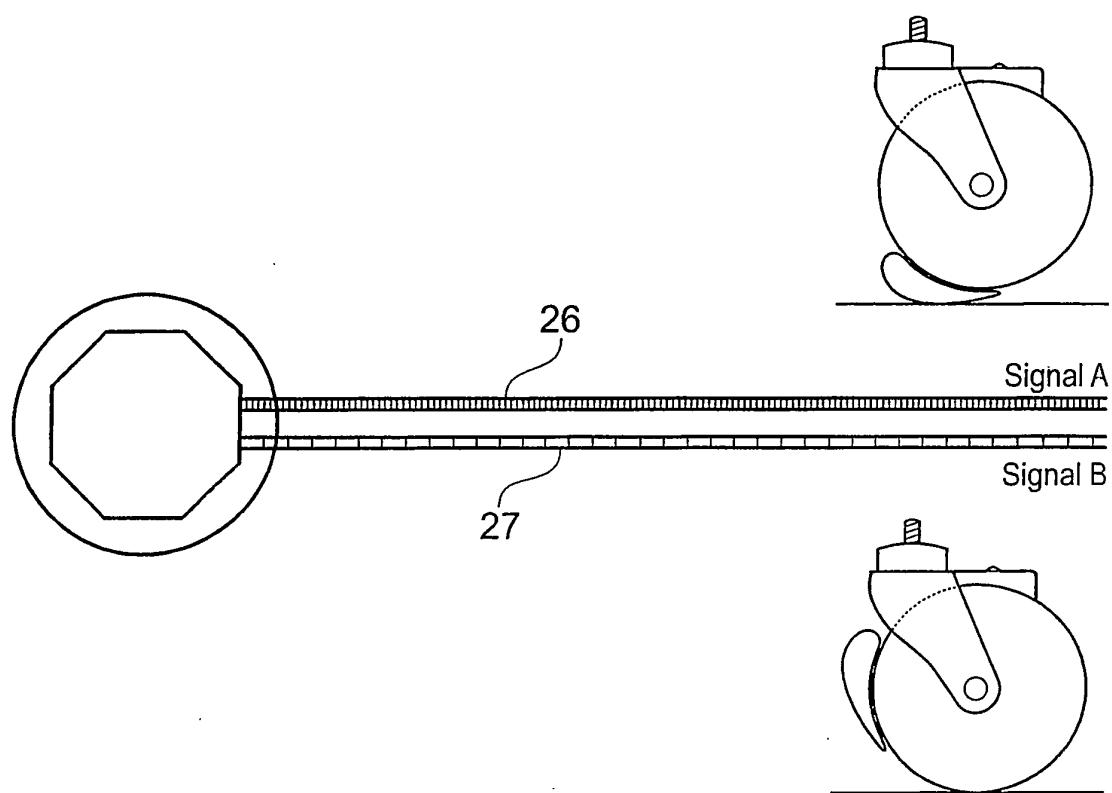


Fig. 11

REFERENCES CITED IN THE DESCRIPTION

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